

CLAIMS

What is claimed is:

1. A masonry or rock drilling tool suitable for use with a rotary hammer comprising:

a drilling head at a forward end of the tool, a forwardly extending cutting plate formed with said drilling head, first and second opposing axially extending channels formed on the circumferential periphery of said drilling head;

a clamping shank at a rearward end of the tool suitable for fitment within a tool holder of a rotary hammer;

an intermediate helical conveying portion extending between the drilling head and the clamping shank, at least four helically extending flutes separated by corresponding helically extending webs formed on said intermediate helical conveying portion;

a central chiselling dome and a pair of cutting edges extending radially outwardly from the chiselling dome formed on said cutting plate, each cutting edge has a trailing relief face and an acute angle between the relief face and the longitudinal axis of the tool varies from a radially inner portion to a radially outer end of each cutting edge; and

said first axially extending channel extends axially rearwardly from a forward facing face of the drilling head into a plurality of the at least four flutes and said second axially

extending channel extends axially rearwardly from the forward facing face of the drilling head into a different plurality of the at least four flutes.

2. A tool according to claim 1 wherein the acute angle increase from the radially inner to the radially outer end of each cutting edge.
3. A tool according to claim 1 wherein the web or webs that separate the pluralities of flutes each terminate at a location circumferentially central of the associated axially extending channel.
4. A tool according to claim 1 wherein there are four flutes and the first axially extending channel extends into a pair of the four flutes and the second axially extending channel extends into the remaining pair of the four flutes.
5. A tool according to claim 1 wherein the cutting plate extends transversely across the drilling head and the first channel is formed to a first side of the cutting plate and the second channel is formed to a second opposite side of the cutting plate.
6. A tool according to claim 1 wherein each cutting edge forms a boundary between a respective cutting face and a respective trailing relief face of the cutting plate.

7. A tool according to claim 6 wherein the acute angle between the cutting face and the longitudinal axis of the tool increases from the radially inner portion to the radially outer end of each cutting edge.

8. A tool according to claim 1 wherein the dome is elliptical with the major axis of the ellipse extending substantially parallel to the cutting edges.

9. A tool according to claim 1 wherein the two axially extending channels together extend over between 35% and 70% of the circumferential surface of the drilling head and in particular between 40% and 60% for larger diameter tools.

10. A tool according to claim 1 wherein the axially extending channels have bases with a diameter of between 40% and 85% of the diameter of the drilling head and in particular between 40% and 60% for larger diameter tools.

11. A tool according to claim 1 wherein the surfaces of the channels are substantially parallel to the longitudinal axis of the tool.

12. A tool according to claim 1 wherein the channels are concave.

13. A tool according to claim 1 wherein auxiliary cutters are fitted or formed at the forward end of the drilling head.

14. A tool according to claim 13 wherein the auxiliary cutters each trail a cutting edge of the cutting plate in the direction of rotation.

15. A tool according to claim 14 wherein an additional auxiliary axially extending channel is formed on the circumferential periphery of the drilling head between each auxiliary cutter and the cutting edge of the cutting plate trailed by said auxiliary cutter and each auxiliary channel extends axially from the forward facing face of the drill head into at least one of the at least four flutes.

16. A tool according to claim 1 wherein the at least four webs have the same diameter.

17. A tool according to claim 16 wherein each of the webs has a radially outwardly facing surface for guiding the drilling tool within a drilled hole.

18. A tool according to claim 1 wherein the at least four webs include at least two primary webs and at least two auxiliary webs of reduced diameter compared to the primary webs.

19. A tool according to claim 18 wherein the primary webs each have a radially outwardly facing surface for guiding the drilling tool within a drilled hole.

20. A tool according to claim 18 wherein the auxiliary webs come to a point at their radially outer ends.

21. A tool according to claim 18 wherein an auxiliary web separates the flutes into which each axially extending channels extend and the auxiliary web terminates in a circumferentially central portion of the corresponding channel.

22. A masonry or rock drilling tool suitable for use with a rotary hammer comprising:

a drilling head at a forward end of the tool, a forwardly extending cutting plate fitted or formed on said drilling head, first and second opposing axially extending channels formed on the circumferential periphery of said drilling head;

a clamping shank at a rearward end of the tool suitable for fitment within a tool holder of a rotary hammer;

an intermediate helical conveying portion extending between the drilling head and the clamping shank, and at least four helically extending flutes separated by corresponding helically extending webs;

said first axially extending channel is concave and extends axially rearwardly from a forward facing face of the drilling head into a plurality of the at least four flutes and said second axially extending channel is concave and extends axially rearwardly from the forward facing face of the drilling head into a different plurality of the at least four flutes.

23. A tool according to claim 22 wherein the web or webs that separate the pluralities of flutes each terminate in a location circumferentially central of the associated axially extending channel.

24. A tool according to claim 22 wherein there are four flutes and the first axially extending channel extends into a pair of the four flutes and the second axially extending channel extends into the remaining pair of the four flutes.

25. A tool according to claim 22 wherein the cutting plate extends transversely across the drilling head and the first channel is formed to a first side of the cutting plate and the second channel is formed to a second opposite side of the cutting plate.

26. A tool according to claim 22 wherein the cutting plate is formed with a central chiselling dome and a pair of cutting edges extending radially outwardly from the chiselling dome, wherein each cutting edge has a trailing relief face.

27. A tool according to claim 26 wherein an acute angle between the relief face and the longitudinal axis of the tool varies, for example by increasing, from a radially inner portion to a radially outer end of each cutting edge.

28. A tool according to claim 26 wherein each cutting edge forms a boundary between a respective cutting face and a respective trailing relief face of the cutting plate.

29. A tool according to claim 28 wherein an acute angle between the cutting face and the longitudinal axis of the tool varies, for example by increasing, from a radially inner portion to a radially outer end of each cutting edge.

30. A tool according to claim 26 wherein the dome is elliptical with the major axis of the ellipse extending substantially parallel to the cutting edges.

31. A tool according to claim 22 wherein the two axially extending channels together extend over between 35% and 70% of the circumferential surface of the drilling head and in particular between 40% and 60% for larger diameter tools.

32. A tool according to claim 22 wherein the axially extending channels have bases with a diameter of between 40% and 85% of the diameter of the drilling head and in particular between 40% and 60% for larger diameter tools.

33. A tool according to claim 22 wherein the surfaces of the channels are substantially parallel to the longitudinal axis of the tool.

34. A tool according to claim 22 wherein auxiliary cutters are fitted or formed at the forward end of the drilling head.

35. A tool according to claim 34 wherein the auxiliary cutters each trail a cutting edge of the cutting plate in the direction of rotation.

36. A tool according to claim 35 wherein an additional auxiliary axially extending channel is formed on the circumferential periphery of the drilling head between each auxiliary cutter and the cutting edge of the cutting plate trailed by said auxiliary cutter and each auxiliary channel extends axially from the forward facing face of the drill head into at least one of the at least four flutes.

37. A tool according to claim 22 wherein the at least four webs have the same diameter.

38. A tool according to claim 37 wherein each of the webs has a radially outwardly facing surface for guiding the drilling tool within a drilled hole.